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Filing Date: November 27, 2000
Title: CIRCUITS AND METHODS FOR A RING NETWORK

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85. (NEW)   The method of claim 83, wherein the step of storing the source address in an address table comprises the step of storing the source address for the data packet in a single address table with a multi-bit signal indicating the port associated with the source address.

86. (NEW)   A method for routing data packets in a plurality of ring switches in a ring network, the method comprising:

receiving a data packet at a first ring port of at least one ring switch of the plurality of ring switches in a ring network;

reading a destination address from the data packet; and

routing the data packet in reference to an address table for the at least one ring switch such that if the destination address of the data packet is associated with a network device that is local to the at least one ring switch, the data packet is transmitted out one or more local ports of the at least one ring switch, otherwise, if the destination address of the data packet is not associated with a network device that is local to the at least one ring switch, the data packet is transmitted out a second ring port of at least one ring switch so as to allow unidirectional transmission on the ring network.

87. (NEW)   The method of claim 86, wherein the first ring port of the at least one ring switch and the second ring port of the at least one ring switch are a single bi-directional ring port.

88. (NEW)   The method of claim 86, wherein receiving the data packets and routing the data packets are done without use of a token or encapsulating the data packets.

89. (NEW)   The method of claim 86, wherein the plurality of ring switches are coupled by one of conductors on a printed circuit board, fiber optic lines, co-axial cable, and wire conductors.

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90. (NEW)   The method of claim 86, further comprising:

discarding the data packet when a source address corresponds to a network device

that is associated with a local port of the at least one ring switch.

91. (NEW)   The method of claim 86, further comprising:

discarding the data packet when a ring switch ID that is appended, prepended, or

added to the data packet corresponds to the ring switch ID of the at least one ring

switch.

92. (NEW)   The method of claim 86, further comprising:

discarding the data packet when a counter that is appended, prepended, or added to

the data packet exceeds a specified value, wherein the counter is incremented as

the data packet traverses the ring network.

93. (NEW)   A ring switch for a ring network, the ring switch comprising:

at least one ring port that is coupleable to transport data packets in a ring network;

at least one local port that is coupleable to at least one local area network or

device;

at least one address table that is adapted to track the addresses of network devices

associated with each port of the ring switch based on source addresses; and

wherein data packets received at the at least one ring port that are destined for a

network device associated with any of the at least one local ports of the ring

switch based on the at least one address table are removed from the ring and

switched out the local port.

94. (NEW)   The ring switch of claim 93, wherein data packets received at the at least

one ring port that are not destined for a network device associated with any of the at

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least one local ports of the ring switch are switched to another ring switch coupled to the at least one ring port based on the at least one address table.

95. (NEW)   The ring switch of claim 93, wherein the at least one ring port of the ring switch is a single bi-directional ring port.

96. (NEW)   The ring switch of claim 93, wherein the at least one ring port of the ring switch further comprises a ring-in port and a ring-out port.

97. (NEW)   The ring switch of claim 93, wherein switching the data packets is done without use of a token or encapsulating the data packets.

98. (NEW)   The ring switch of claim 93, wherein the at least one ring port of the ring switch is coupleable to the ring network by one of conductors on a printed circuit board, fiber optic lines, co-axial cable, and wire conductors.

99. (NEW)   The ring switch of claim 93, wherein the ring switch discards the data packet when a source address corresponds to a network device that is associated with a local port of the ring switch.

100. (NEW)   The ring switch of claim 93, wherein the ring switch discards the data packet when a ring switch ID that is appended, prepended, or added to the data packet corresponds to the ring switch ID of the ring switch.

101. (NEW)   The ring switch of claim 93, wherein the ring switch discards the data packet when a counter that is appended, prepended, or added to the data packet. exceeds a specified value, wherein the counter is incremented as the data packet traverses a ring network.

102. (NEW)   A ring network comprising:

    multiple ring switches, communicatively coupled by a plurality of segments to form a ring, each ring switch having at least one ring port and at least one local port;

    each ring switch having at least one address table that associates which network devices are associated with each port of the ring switch; and

    wherein data packets received at a ring port that are destined for a network device associated with a local port of the ring switch are switched off the ring based on the at least one address table so as to free up downstream bandwidth on the plurality of segments to allow unidirectional transmission on the ring network with increased capacity.

103. (NEW)   The ring network of claim 102, wherein the multiple ring switches each include a ring-in and a ring-out port.

104. (NEW)   The ring network of claim 102, wherein the ring switches each include a single, bi-directional ring port that allows data packets received at the bi-directional ring port to be retransmitted out the ring port of the switch so that data packets can be forwarded on to other ring switches in the ring network.

105. (NEW)   The ring network of claim 102, wherein switching the data packets is done without use of a token or encapsulating the data packets.

106. (NEW)   The ring network of claim 102, wherein at least one ring switch of the ring network discards the data packet when a source address corresponds to a network device that is associated with a local port of the ring switch.

107. (NEW)   The ring network of claim 102, wherein at least one ring switch of the ring network discards the data packet when a ring switch ID that is appended, prepended,

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or added to the data packet corresponds to the ring switch ID of the ring switch.

108. (NEW) The ring network of claim 102, wherein at least one ring switch of the ring network discards the data packet when a counter that is appended, prepended, or added to the data packet exceeds a specified value, wherein the counter is incremented as the data packet traverses a ring network.

109. (NEW) A method for operating a ring switch of a ring network, the method comprising:

receiving data packets from the ring network at a ring-in port of a ring switch;

routing the data packets that are destined for a network device associated with at least one local port of the ring switch to the at least one local port;

routing the data packets that are not destined for a network device associated with the at least one local port to a ring-out port; and

transmitting the data packets from the ring-out port to another ring switch.

110. (NEW) The method of claim 109, wherein receiving the data packets and transmitting the data packets are done without use of a token or encapsulating the data packets.

111. (NEW) The method of claim 109, wherein the ring-in port and the ring-out port are a single bi-directional ring switch port.

112. (NEW) The method of claim 109, further comprising:

comparing a source address from the data packet with at least one address table of the ring switch, wherein the at least one address table indicates which addresses are associated with each port of the switch; and

when the source address is not in the address table, associating the source address with the ring-out port in the address table.

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113. (NEW)   The method of claim 109, further comprising:

   discarding the data packet when a source address corresponds to a network device

   that is associated with a local port of the ring switch.

114. (NEW)   The method of claim 109, further comprising:

   discarding the data packet when a ring switch ID that is appended, prepended, or

   added to the data packet corresponds to the ring switch ID of the ring switch.

115. (NEW)   The method of claim 109, further comprising:

   discarding the data packet when a counter that is appended, prepended, or added to

   the data packet exceeds a specified value, wherein the counter is incremented as

   the data packet traverses the ring switch.

116. (NEW)   A method for operating a network of a plurality of ring switches, the

   method comprising:

   placing data packets on a network containing a plurality of ring switches;

   receiving the data packets from the ring network at a ring-in port of a ring switch of

      the plurality of ring switches;

   switching the data packets that are destined for a network device associated with at

      least one local port of the ring switch to the at least one local port of the ring

      switch; and

   transmitting the data packets that are not destined for a network device associated

      with the at least one local port of the ring switch from a ring-out port of the ring

      switch of the plurality of ring switches to another ring switch of the plurality of

      ring switches.